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## Digital innovation and transformation: An institutional perspective

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## A B S T R A C T

In this conceptual piece we suggest that the institutional perspective is a prolific lens to study digital innovation and transformation. Digital innovation is about the creation and putting into action of novel products and services; by digital transformation we mean the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations and fields. We identify three types of novel institutional arrangements critical for digital transformation: digital organizational forms, digital institutional infrastructures, and digital institutional building blocks. From this vantage point, an institutional perspective invites us to examine how these novel arrangements gain social approval (i.e. legitimacy) in the eyes of critical stakeholders and their interplay with existing institutional arrangements. Questioning the disruptive talk associated with digital transformation, we draw on the institutional change literature to illustrate the institutionalization challenges and that existing institutional arrangements are pivotal arbiters in deciding whether and how novel arrangements gain acceptance. We close this essay with discussing the implications of an institutional perspective on digital transformation for policy, practice and research.

## 1. Introduction

Numerous scholars argue that there is a need for new theories in this age of digital innovation and digital transformation. Because innovation processes themselves are subject to digitization, the argument is that accepted theories of innovation are no longer applicable (Nambisan, Lyytinen, Majchrzak, & Song, 2017; Svahn, Mathiassen, & Lindgren, 2017; Yoo, Boland, Lyytinen, & Majchrzak, 2012). For instance, Nambisan et al. (2017: 223) say that “[t]here is a critical need for novel theorizing on digital innovation management” that deals more adequately with the rapidly changing nature of innovation processes in a digital world.

For Nambisan et al. (2017:224) digital innovation is the use of digital technology in a wide range of innovations: We understand the term “digital” as the conversion from mainly analog information into the binary language understood by computers. The malleability (e.g., re-programmability), homogeneity (e.g., standardized software languages) and transferability (e.g. ease of transferring digital representations of any object) is at the heart of technologies meshing digital, and often physical materiality, thereby enabling, constraining, but also interwoven with, human action (Altman, Tushman, & Nagle, 2015; Flyverbom, Leonardi, Stohl, & Stohl, 2016; Lakhani, Lifshitz-Assaf, & Tushman, 2013; Leonardi & Barley, 2008; Loebbecke & Picot, 2015; Yoo, Henfridsson, & Lyytinen, 2010). As such, digital innovation is about the concerted orchestration of new products, new processes, new services, new platforms, or even new business models in a given context (Nambisan et al., 2017; see also Hargadon & Douglas, 2001).

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But what constitutes novel theorizing? One important way of introducing new approaches into a field of study is to import ideas from other disciplines. Historically, for example, the extension of general systems theory into theorizing about organizations transformed existing approaches and led to completely new ways of thinking about organizations (Hinings & Greenwood, 2017). This paper argues that the well-developed institutional perspective has concepts and theorizing that are highly relevant to the study of digital innovation and especially when the range and depth of such innovations leads to digital transformation (for a similar approach see also Orlikowski & Barley, 2001). By *digital transformation* we mean the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields (Krimpmann, 2015; Loebbecke & Picot, 2015; Mangematin, Sapsed, & Schüßler, 2014).

Institutional theory emphasizes that organizations are not purely rational systems of producing goods and services, adapting to an environment of suppliers, consumers, and competitors. Importantly, they are themselves social and cultural systems that are embedded within an “institutional” context of social expectations and prescriptions about what constitutes appropriate (“legitimate”) behavior. For most organizations, the crucial context is that of the organizational field, and critical actors within the field include regulators, professional associations and the media. These actors, along with various events (such as conferences) constitute the “institutional infrastructure” that interprets, conveys, and monitors compliance with, the socio-cultural rules of the game (Hinings, Logue, & Zietsma, 2017). From an institutional perspective, organizations cannot be understood without taking account of the influence of this institutional context. Organizations are seriously constrained by social expectations and the social approval - legitimacy - of particular actions and ways of organizing (Deephouse & Suchman, 2008; Greenwood, Oliver, Lawrence, & Meyer, 2017; Meyer & Rowan, 1977).

By emphasizing the socio-cultural aspects of organizing, institutional theory has developed a particular approach to understanding change and innovation. There are two aspects to this approach: one is to hold in tension the relationship between stasis and change, seeing continuity and homogeneity as well as change and heterogeneity amongst organizations (Greenwood et al., 2017). The other is to understand change and stasis as an outcome of structures, activities and actions at multiple levels of analysis, societal, field, organization and individual (Scott, 2014). These two approaches produce a richness and a complexity to understanding innovation at the level of new products, services and processes, but also, and perhaps more importantly, an emphasis on issues of digital transformation or radical change (Greenwood & Hinings, 2006).

The rest of the paper examines what institutional theory can contribute to our understanding of digital innovation and digital transformation, in particular, through the ideal of radical change.

## 2. An institutional perspective on digital innovation and digital transformation

The early history of institutional theory provided a particular version of change and stasis, namely, that organizations come to look more and more like each other because of the strength of legitimacy and socio-cultural pressures (Meyer & Rowan, 1977). A central process is that of isomorphism, that is, that organizations come to look more and more alike through normative, mimetic and coercive pressures (DiMaggio & Powell, 1983). This early account of change was first illustrated by Tolbert and Zucker's (1983) study of municipal civil service reform in the US. They showed that initial adoption of an organizational innovation could be explained by the characteristics of a city, e.g., socio-economic structure, size, influx of immigrants. In this sense, early adoption follows a contingency style argument (Van de Ven, Ganco, & Hinings, 2013) – i.e., as a rational response to issues that a city faced. However, further adoption by other municipalities was not related to these kinds of characteristics but because civil service reform had become accepted as the right way to do things – it had acquired social legitimacy – even though the reforms might not offer any performance improvement. The reforms had become the appropriate way of conducting affairs and were prescribed and policed by the institutional infrastructure.

Adoption becomes a way of demonstrating organizational legitimacy through copying other organizations (mimetic isomorphism), or is legislated because of that societal legitimacy (coercive legitimacy) or is diffused as the appropriate professional standard (normative legitimacy). This speaks to the impact of socio-cultural beliefs on the adoption of innovations and consequent organizational change. This two-stage model of diffusion with its emphasis on the increasing homogeneity of organizations was central in the following decades of institutional studies (Greenwood, Oliver, Sahlin, & Suddaby, 2008).

There has been considerable questioning of this model, primarily on the grounds of its lack of any account of agentic action, its inability to address circumstances of institutional complexity, and evidence of differing organizational responses (Boxenbaum & Jonsson, 2017; Oliver, 1991, 1992). Nevertheless, continuing compliance with existing norms and practices together with their ‘taken-for-grantedness’ remains at the heart of institutional theory (Meyer & Höllerer, 2014). How organizations are influenced by socio-cultural prescriptions, we suggest, has important implications for the study of digital innovation and transformation.

Studying digital innovation and transformation from an institutional perspective is about how digitally-enabled institutional arrangements emerge and diffuse both through fields and organizations. The question for an institutional theorist becomes: How do these new ideas gain legitimacy? How are they conveyed and spread within and through organizational fields? Of particular concern here in examining digital innovations and their suggested radical nature, is the interplay between existing and new, emerging institutional arrangements (Dougherty & Dunn, 2011; Hargadon & Douglas, 2001; Vermeulen, Büch, & Greenwood, 2007). For example this can be new institutional arrangements replacing or complementing existing ones as with Airbnb and traditional hotel chains coexisting in the tourism industry and organizations working with crowd-based organizations to solicit innovative ideas from outside or outsource routine tasks. But the existing institutions can enable new ones, e.g. the Uber platform is a new organizational form that disrupts the taxi industry, yet this digital innovation that creates a novel form of organizing taxi services through leveraging

**Table 1**  
Overview of digital innovations from an institutional perspective.

| Digital innovations                   | Definition  | Exemplary examples   | Selected references  |
|---------------------------------------|---|--|--|
| Digital organizational forms          | A novel digital organizational form is an digitally-enabled arrangement of practices, structures, and values constituting an organization's core and that is appropriate in a given institutional context | <ul style="list-style-type: none"> <li>● Airbnb,</li> <li>● Uber</li> <li>● GalaxyZoo</li> </ul>                     | Bauer and Gegenhuber (2015), Franzoni and Sauermann (2013), Mair and Reischauer (2017) |
| Digital institutional infrastructures | Standard-setting digital technologies enabling, constraining and coordinating numerous actors' actions and interactions in ecosystems, fields or industries   | <ul style="list-style-type: none"> <li>● Product platforms (e.g. Apple)</li> <li>● Blockchain and Bitcoin</li> </ul> | Botzem and Dobusch (2012), Gawer and Cusumano (2013), Tapscott and Tapscott (2017)     |
| Digital institutional building blocks | Generally-accepted, ready-made or customizable modules encompassing sets of digital technologies for running or creating an organization  | <ul style="list-style-type: none"> <li>● ERP systems</li> <li>● Square</li> <li>● Wordpress</li> </ul>               | Berente and Yoo (2012), Davis (2013), Majchrzak and Markus (2012)                      |

digital technology, is actually brought about by a rather traditional hierarchical organization (Bauer & Gegenhuber, 2015; Gegenhuber & Dobusch, 2017; Sundararajan, 2017).

So far we have presented a fairly generic view of institutional theory, digital innovation and digital transformation emphasizing change from one set of legitimated, existing institutional arrangements to new ones, striving for legitimacy. But there is diversity within the world of digital innovation and institutional arrangements so the next part of the paper elaborates on that diversity. Initially we look at types of digital innovation and the ways in which they relate to institutional arrangements, shown in Table 1. This is followed by a section on the relationship between digital innovation and digital transformation.

### 2.1. Novel digital organizational forms

A novel digital organizational form is a digitally-enabled arrangement of practices, structures, and values constituting an organization's core that is appropriate in a given institutional context (Bauer & Gegenhuber, 2015; Felin, Lakhani, & Tushman, 2017; Mair & Reischauer, 2017). Prototypical examples are the crowd-based platforms of Airbnb and GalaxyZoo. Airbnb facilitates exchanges between travelers and people having an idle resource of a spare room (Mair & Reischauer, 2017). GalaxyZoo (now Zoouniverse) calls upon the general public to classify galaxies (Franzoni & Sauermann, 2013). Since the task is highly decomposable (i.e., classifying one galaxy at a time), the web-based platform distributes the tasks to the crowd and integrates the crowd's contributions automatically into its database, a mechanistic system par excellence (Burns & Stalker, 1961).

Both platforms gained cognitive legitimacy because they were developed and promoted using language that aligned them with a particular class or category of organizations/industries that already had legitimacy (Bitektine, 2011; Suchman, 1995). For example, in the eyes of its users, Airbnb is a legitimate service for renting out or staying at private homes. Moreover, financial analysts share this positive evaluation – as indicated by Airbnb's estimated market value as surpassing those of major hotel chains (Mair & Reischauer, 2017; Tsang, 2017). GalaxyZoo established the category of crowd science turning thousands of people outside the scientific profession into research assistants. The numerous running-up projects on Zoouniverse suggest that the practice of including citizens in research diffuses among professionals in academic and scientific institutions, presumably a combination of mimetic and normative processes (Franzoni & Sauermann, 2013).

Thus, one form of digital innovation produces new organizational forms. What institutional theory tells us is that to become established such forms have to gain legitimacy, usually by processes of theorizing (Strang & Meyer, 1993) where the innovators present arguments concerning the problems and issues that they are solving. As we study digital innovation, institutional theory invites us to research how new forms develop, how they are diffused and as a critical part of development and diffusion, how they gain legitimacy.

### 2.2. Novel digital institutional infrastructures

An important aspect of digital innovation is the construction and acceptance of standards, which we define as standard-setting digital technologies that enable, constrain and coordinate numerous actors' actions and interactions in ecosystems, fields or industries (Nambisan, 2016; Star, 2002; Tilson, Lyytinen, & Sørensen, 2010; Timmermans & Epstein, 2010; Yoo et al., 2010). Creators of digital infrastructures seek to infuse their norms, values, or institutional logics, into the infrastructure (Gawer & Phillips, 2013; Orlikowski, 2007; Orlikowski & Scott, 2008). Typically, private actors orchestrate digital institutional infrastructures, bringing issues to the forefront such as the challenge of institutionalizing the infrastructure, establishing a governance system reproducing social order, and questions of value appropriation and control (Botzem & Dobusch, 2012; Djelic & Sahlin-Andersson, 2006; Garud, Jain, & Kumaraswamy, 2002; Garud & Karnoe, 2003; Raynard, 2016).

A prototypical example of this form of infrastructure is a product platform. In product platforms multiple actors in the ecosystem have different roles in the process of creating novel innovations, producing or delivering of products and services. Consider the example of Apple, a platform leader creating an ecosystem consisting of several products (e.g. phone, laptops), services (e.g. iTunes) and its relationship with complementary actors such as external developers. Apple can define in some areas how complementary actors participate (e.g. setting rules how external developers can access the Appstore market), but less so in other areas (e.g. no direct

relationship to producers of protective sleeves for phones). Apple is an economically powerful platform leader, acting as de facto ‘government’ of the ecosystem. Amongst other mechanisms, Apple uses coercion to maintain a desired social order, such as defining the platform architecture serving as a ‘constitution’ for the entire ecosystem (Baldwin & Woodard, 2008; Gawer & Cusumano, 2013; Lakhani et al., 2013).

Another example is blockchain technology, which is, simply put, a giant spreadsheet or database. In contrast to traditional, centrally stored databases following a corporate institutional logic (Thornton, Ocasio, & Lounsbury, 2012), the blockchain spreadsheet is a peer-to-peer network where data is stored on the distributed computers of the network. Crucial elements of the blockchain technology are data integrity and security (e.g. no central institution that can be hacked), platform governance (e.g. achieving agreement within the peer-to-peer network whether another row should be added to the spreadsheet), transparency (e.g. keeping accessible records of all transactions with a time-stamp), database maintenance (e.g. providing incentives to the crowd to donate computational power to maintain the database), and smart contracts (e.g. automatic execution of transactions if both exchange parties meet specific pre-defined criteria). Blockchain technology promises to reduce the cost and time for making transactions, thereby posing a threat to traditional intermediaries. For instance, the blockchain-based cryptocurrency Bitcoin enables users to transfer money around the globe with less cost than traditional money transfer services such as Western Union (Tapscott & Tapscott, 2017). Other potential blockchain applications are, for instance, distributed health care records (Ekblaw, Azaria, Halamka, & Lippman, 2016). Blockchain technology is not yet an institutional infrastructure, rather various “proto-institutional” (Lawrence, Hardy, & Phillips, 2002) blockchain platforms (e.g. Ethereum, Multichain, etc.) varying in their practices, rules, and architecture vie for becoming a common standard.

These examples speak to how digital innovations require building infrastructures that go beyond the particular innovation and organization. Institutional infrastructure links different actors and, critically, provides governance and regulation and establishes legitimate logics and courses of action. How this happens in the world of digital innovation is a major area of research.

### 2.3. Digital institutional building blocks

Interesting and potentially transformational elements in digital innovation are digital institutional building blocks. These are generally-accepted, ready-made or customizable modules encompassing sets of digital technologies for running or creating an organization (Baldwin & Clark, 2000; Davis, 2013, 2016; Meyer & Rowan, 1977; Nambisan, 2016; Yoo et al., 2010). Our inspiration for this concept stems from Davis (2013) who depicts an entrepreneur building an application without to leave his/her couch. The entrepreneur creates a webpage via wordpress, can hire programmers via the platform Upwork and sell the application either via an appstore or use a payment systems such as Square. Davis concludes that “[...] Meyer and Rowan’s poetic description of postindustrial organization has essentially come true. In a hyperrationalized postindustrial economy like the United States, ‘[T]he building blocks for organizations come to be littered around the societal landscape, it only takes little energy to assemble them into a structure’” (Davis, 2013: 299, see also Meyer and Rowan, 1977: 345). Building blocks come with a value-laden design (e.g. enterprise resource planning systems embracing the logic of managerial rationalism, Berente & Yoo, 2012) and a varying degree of technological affordances, that is the action potential or what people can do with it (Majchrzak & Markus, 2012). Square facilitating electronic and credit card payments determines payment fees, payment processes and provides non-adaptable material items for making payments in physical locations. In contrast, Wordpress modules give creators almost unlimited freedom in assembling a website. Entrepreneurs may adopt building blocks because they are a taken-for-granted way to do things (e.g. Wordpress to establish a blog, Slack as an internal communication tool) or due to mimetic reasons aiding a venture to overcome the liability of newness in the eyes of external audiences (Stinchcombe, 1965). For instance, a venture uses the Square payment system because it is widely-applied and accepted by customers.

These digital building blocks demonstrate a ‘mix-and-match’ approach to innovation and change. As such, two things stand out. First, they raise the possibility of being truly transformational because of the innovative patterns that can be established. Second, as with all innovation and change within an institutional argument, there needs to be both separate legitimacy for each building block, but also collective legitimacy for whatever new institutional arrangement arise.

## 3. Digital transformation as a radical institutional change

As we have previously said, *digital transformation* comes from the combined effects of several digital innovations bringing about novel actors, structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields.

Thus, it marks a point where the combined effects of digital innovations lead to the emergence of new organizational forms, new institutional infrastructure, and new institutional building blocks. These combined effects are a ‘dramatically altering contextual force’, where it seems insufficient to engage in mere fine tuning – rather, radical change takes place at the level of organizations and the field (Greenwood & Hinings, 1996). Radical change occurs if organizations or fields move from one in-use organizing pattern encompassing practices, structures, and values to another (Greenwood & Hinings, 1996; Pache & Santos, 2010; Purdy & Gray, 2009). In particular, radical change at the field level is the emergence of a new, legitimated form of both organization and institutional infrastructure that is theorized and translated for the field (Boxenbaum & Jonsson, 2017; Strang & Meyer, 1993). Thus, digital transformation is without doubt, institutional change.

The difficulties of innovation and change at the organizational and field level are a long standing issue in institutional theory and organization theory more generally (cf. Barrett & Hinings, 2015; Burns & Stalker, 1961). Burns and Stalker (1961), for example,

devote considerable time to analyzing the various ‘pathologies’ that prevented organizations moving from ‘mechanistic’ to more ‘organic’ organizational forms (a radical, transformational, change). Similarly, Kellogg (2011) found that despite clear evidence of serious errors and accidents within hospitals, successful resistance to change was more common than reform (see also, Ferlie, Fitzgerald, Wood, & Hawkins, 2005). In terms of institutional theory, the difficulties of radical change spring from what is taken-for-granted in socio-cultural terms and the ways in which the legitimacy of particular ways of organizing become tied to issues of existing logics, power and interests (Lawrence & Buchanan, 2017; Thornton et al., 2012). Our approach to digital transformation defines it as radical and is strongly tied to theories and concepts about the difficulties of such change, not least because of issues of legitimacy.

Recent studies at the organizational level draw on this kind of thinking in their exploration of the challenges and consequences when adopting various novel digital institutional arrangements. Consider NASA's shift towards ‘open innovation’ (Chesbrough, 2006; West & Bogers, 2014), where the existing organization turned to the novel organizational form of crowdsourcing intermediaries in order to tap into external crowds for solving pressing innovation problems (Lakhani et al., 2013; Lifshitz-Assaf, 2017). This is a radical, transformational, change—a leading, prestigious scientific institution asks its scientists to shift their logic from being world-renowned problem solvers to solution seekers curating ideas from an expert crowd. To facilitate this change, NASA engaged in knowledge boundary work, which is active work to expand and reconstruct the professional identity of scientists (Lifshitz-Assaf, 2017).

Gawer and Phillips (2013) shed light on the dynamics of an organization adapting and seeking leadership in orchestrating a novel digital institutional infrastructure. They show how IBM sought platform leadership by successfully responding to a field level shift from a supply chain logic (of large scale vertical integrated producers) to a product platform logic. IBM engaged in institutional work on two fronts: by securing support from its external environment through practice work and legitimacy work and by addressing the internal environment through internal practice and identity work.

Barrett, Oborn, Orlikowski, and Yates (2012) depict the ramifications of experimenting with a novel digital building block to maintain an organization's operations. The empirical context of their study was a hospital pharmacy implementing a robot for dispensing medicine, which changed the practices of dispensing medicine, and ultimately caused shifts in the occupational identities and boundaries of pharmacists, technicians, and assistants. Pharmacists and technicians maintained or expanded their occupational jurisdiction whereas assistants lost autonomy as they became completely dependent on the robot.

These are cases of digital innovation that becomes digital transformation, a radical organizational change with all of the attendant difficulties of competing logics, institutional complexity and questions of legitimacy (Greenwood, Raynard, Kodeih, Micelotta, & Lounsbury, 2011).

Moving from the organizational to the field level, a level of analysis that is critical for institutional theory, we find an abounding opportunity space for researching digital transformation. As Mignerat and Rivard (2009) pointed out in their review of information systems innovation and institutionalization, there is a dearth of studies at the field level, a level of analysis that is critical for institutional theory (Zietsma, Groenewegen, Logue, & Hinings, 2017). The last two decades of institutional theory have been particularly concerned with explicating the processes, mechanisms, and practices that underlie major institutional change, including difference and heterogeneity (Greenwood et al., 2017). Understanding digital transformation warrants examining how new digitally enabled institutional arrangements emerge, diffuse (i.e. digital innovations) and thus become accepted as legitimate within an institutional context (Garud, Tuertscher, & Van de Ven, 2013; Hargadon & Douglas, 2001; Mangematin et al., 2014). Digital transformation starts when there is disruption and destruction of established business models, value chains and organizational processes and novel arrangements become embedded and institutionalized (Mangematin et al., 2014). Examples abound, such as Spotify and its impact on the existing distribution of music; Netflix and its challenge to established ways of delivering television programmes; Facebook and the impact it has already had on the news media business.

Some digital innovations challenge existing field level institutional arrangements more than others, having to deal with issues of legitimacy and regulation. For example, the introduction of Uber is a field level phenomenon and is a direct challenge to existing ways of organizing taxi services with their strong regulation in the Western world. Indeed, the framing is of ‘a taxi service’ with all the attendant meanings, legitimacy, and regulation that go with that logic. As a result of its transformational nature, existing values, norms and practices are challenged resulting in push back from existing actors and regulators such as taxi drivers, owners, regulators and municipalities who attempt to apply pre-existing logics.<sup>1</sup> There are already enough examples of a variety of responses for researchers to examine the institutional interplay of Uber in different jurisdictions (Kenney & Zysman, 2016).

The Uber example demonstrates that digital innovation and transformation take place in highly dynamic and uncertain contexts, where values and interests differ between actors and control and decision-making is widely dispersed. Because of the ‘experimental’ nature of both digital innovation and the management of that innovation, there are continuing shifts in actors, their goals and their competencies.

In sum, institutional theory has much to offer in studying digital transformation through ideas of radical change. The earlier studies of diffusion through isomorphism emphasize convergent change (Greenwood & Hinings, 2006). As digital innovations are introduced in products, services, systems and processes there is a rich area of research to study the two-stage model. In particular to examine adoption as a legitimating process and the extent to which established patterns of isomorphism are at work (Mizruchi & Fein, 1999). In their review of innovation processes, Garud et al. (2013) state that all of the literatures they examined drew attention to the difficulties of innovation, and that an important difficulty was that innovations may be seen as illegitimate (Aldrich & Fiol, 1994;

<sup>1</sup> Hence it comes not at a surprise that Uber seeks to avoid the category taxi service and claims the categorial status of a digital service or sharing economy platform (Scott, 2016).



Lounsbury & Glynn, 2001).

Institutional theory is also clear about innovation taking place at both the field and organizational levels and, in interrelated ways. It is the agency involved in these innovations that has led to the emergence of ideas of 'institutional work' (Hampel, Lawrence, & Tracey, 2017), 'institutional entrepreneurship' (Hardy & Maguire, 2017), 'practices' (Smets, Aristidou, & Whittington, 2017) and interest in the role of emotions (Lok, Creed, DeJordy, & Voronov, 2017). What these theoretical developments, together with the basic concepts of institutional theory tell us, is that even where we have what might be seen as rapid and unprecedented disruption, existing institutional arrangements will still be at work, often challenging the need to change.

#### 4. Implications for practice and policy

How can an institutional perspective on digital transformation inform practice and policy? To illustrate the value of this theoretical lens, we take the point of view of practitioners in organizations and of governmental actors, both facing the challenge of addressing digital transformation.

In a recent interview, Roy Gori, the new CEO of Manulife Financial, Canada (Globe and Mail, 2017) suggested the need for digital transformation within his organization. At the moment, digital transactions account for only 1% of individual premiums; his stated aim was to be like Apple, building a stable company with scale "while still maintaining the mindset of a startup". The company and its competitors are rolling out more and more apps, claims-processing tools, and digital sales tools. At the level of the organization this means changing logics, organizational forms, and practices, all of which are institutionally enabled. The two-stage diffusion model of institutions at a field level could serve as inspiration for achieving the necessary change in an organization such as Manulife. In the first stage, the organization establishes an interdisciplinary innovation hub or lab to carve out a free space for theorizing and experimenting with novel digital technologies (Svahn et al., 2017). In this space the organization can nurture a start-up logic and engage in external legitimation work (e.g. gaining support from key external stakeholders such as media or investors who celebrate adaptation to the changing industry context) and internal legitimation work, such as top-management support for the new value-system, fostering employee understanding of the digital strategy by transparently informing employees about that strategy via a blog as well as using the hub for socializing personnel in a new organizing logic. Having built a legitimate beachhead, the organization can then role out the new organization logic to other parts of the organization. Without doubt, such a strategy also requires change at the field level through interactions with regulators and professional associations. Alternatively, an organization could attempt a revolutionary change affecting all parts of the organization simultaneously (Greenwood & Hinings, 1996), but such an approach would typically benefit from an imminent crisis justifying such a change (Green, 2004). For instance, LEGO was able to successfully leverage its fan crowd as co-creators for new products via a web-based platform (see [ideas.lego.com](http://ideas.lego.com)). Initially, LEGO faced internal resistance to embrace external communities throughout the innovation process. As Lakhani et al. (2013: 371) note regarding the LEGO case, "managing innovation through internal as well as open mechanisms, was not easy to execute. These shifts in managing innovation were only executed under crisis conditions and under a new, externally recruited leadership team" (see also Hatch & Schultz, 2010).

There is also the issue of how institutional theory can enhance our understanding of the impact of digital innovations on policy making. An important insight and one of our themes is how existing institutional frameworks play a major role in determining whether new institutional frameworks are legitimate; that is, policy is developed by existing institutions and they attempt to enforce the practices they deem legitimate (Kenney & Zysman, 2016). Thus, despite being equipped with massive amounts of venture capital and propagating the superiority of their services, the taxi-service Uber has experienced the regulatory power of the state. In spite of their argument that they are a platform only, courts and local governments have ruled that they are a taxi service (see for instance, BBC-News, 2017). Similarly, AirBnB has been fined, in some circumstances, for operating vacation rentals without the correct licences (Scott, 2016). As bitcoin and other cryptocurrencies become more and more prominent, so existing institutions (financial markets, financial regulators) move to develop policies of regulation (Tsukerman, 2016). In an environment characterized by "disruption"-talk and rapid technological development, governments are still crucial actors in arriving at decisions as to what is (in) appropriate practice.

Many times over the past decades it has been suggested that rapid and disruptive change is taking, or will take place. Artificial intelligence was first seen as disruptive in the 1960s (Simon, 1969). Indeed, Simon predicted in 1957 that computers would beat humans at chess within ten years; it actually took 40 years. The dot.com boom of the 90s was similarly proclaimed as earthshaking change but ended with collapse. Admittedly, the pace of technological development today is more rapid (e.g. the expeditious improvement of AI systems due to massive data available for machine learning). Nevertheless, institutional theory speaks to policy makers through the robustness of existing institutional arrangements and their role in effecting the direction, pace and sequencing of change. Despite the more rapid development of technology, there is variation in diffusion and new technologies do not necessarily become legitimated more rapidly. Institutional theory suggests that institutional changes are likely to be over considerable periods of time and regulators and policy makers can still work with 5–10 year time horizons. This is not to say that the changes occurring through digital innovation are not transformational, but it draws attention to the reality of the timelines for such change. There is a time lag between the emergence of new institutional frameworks seeking legitimacy, and existing arrangements, such as the state (regulators, parliaments, courts), reacting to them (Brownsword & Yeung, 2008). From an innovation policy perspective, this time lag is a form of subsidy – it provides actors with a "grey" space to experiment with new business models, and based on the outcome a society can later determine which parts of the business model are appropriate and which parts are not. Policy makers should encourage such experimentation. Lastly, governments can not only react to digital transformation but also proactively shape it. First, governments can influence standard setting through its purchasing power. Imagine if major governmental actors in the US decide to store health care records using a specific blockchain platform—in response other actors would express their social support too, thus

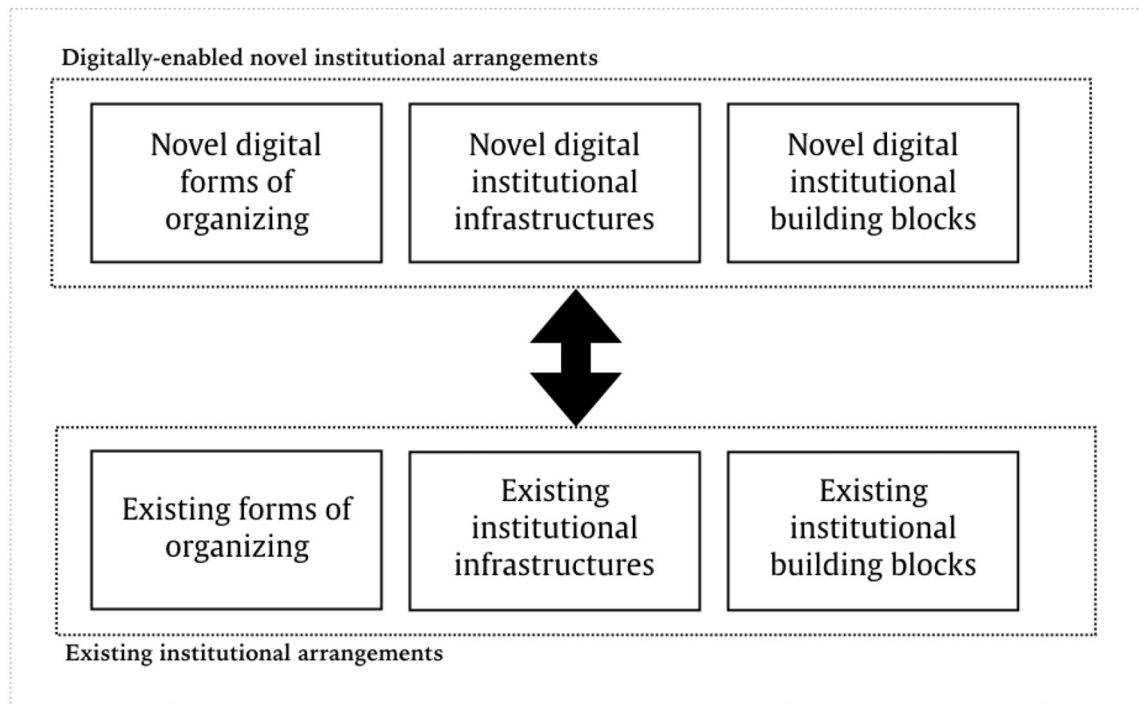


Fig. 1. Interplay novel and existing institutional arrangements.

lending momentum to this blockchain platform's quest for legitimacy. Second, governments may utilize digital innovation themselves to respond to technology changes more swiftly, let alone, use digital technology to strengthen its mandate (e.g. using AI systems to detect fraud) (Brownsword & Yeung, 2008; Noveck, 2009; Perols, Bowen, Zimmerman, & Basamba, 2016).

## 5. Conclusions and implications for future research

Our focus is upon the institutional perspective. This perspective is distinctive in several ways – including, and importantly for our purpose, its emphasis upon the ‘field’-level of analysis, its emphasis upon socio-cultural processes, and its concern with legitimacy. Even with the rapid and disruptive changes that are said to be central to digital innovation and digital transformation these continue to be important factors in institutional change. It is a central tenet of institutional theory that there is always interaction between the new and the old because of the embedded nature of socio-cultural expectations and the importance of legitimacy. Fig. 1 summarizes this.

Informed with an institutional perspective we believe that following research themes will enhance our understanding of digital transformation:

- Unpacking novel institutional arrangements. How do new novel institutional infrastructures emerge and gain legitimacy? For instance, the blockchain phenomenon is a perfect environment to study the emergence of novel digital infrastructures through a cultural entrepreneurship (Lounsbury & Glynn, 2001; Wry, Lounsbury, & Glynn, 2011) or category (Vergne & Wry, 2014) perspective. Against this backdrop, we need more field-level and comparative approaches to study new institutional arrangements. For example, it seems that donation-based crowdsourcing platforms mimicked the Kickstarter model. How do crowdfunding archetypes diffuse? Why are crowdfunding platforms similar? How much variance does exist within a category such as donation-based crowdfunding? This example demonstrates that the two-stage model of adoption for contingent reasons, followed by adoption for legitimacy reasons is a potentially fruitful area of research for digital innovation. What is more, we know little about how novel digital institutional organizational forms actually work. For instance, a growing body of literature examines crowd-based platforms (Bauer & Gegenhuber, 2015; Kornberger, 2017; Mair & Reischauer, 2017; Powell, 2016). However, we lack a coherent theoretical language to understand crowd-based platforms. Although it is possible to get insights from studying the online platforms, researchers should look behind the ‘digital veil’ and also take into account the role of the hierarchical organization running the platform. How do these organizations operate a crowd-based platform? How do platform owners attempt to infuse specific institutional logics into the socio-technical system of the platform (Glaser, 2017; Heimstädt, 2017; Hultin & Mähring, 2014; Leonardi & Barley, 2008; Orlowski, 2007)?
- Synergistic and antagonistic dynamics between old and new institutional arrangements: Consider Drover, Wood, and Zacharakis (2015) finding that venture capitalists use crowdfunding as a quality signal to determine whether a new venture is worth their investment. User innovations, such as novel products created in maker or fab labs (i.e. a new organizational form of community

organizations with 3-D printers and other technologies for production), may later be commercialized by more traditional producers (von Hippel, 2017; West & Greul, 2016). Future research may examine how old and new institutional arrangements complement and reinforce each other. What really is radical and transformational? Conversely, what can we learn about conflicts? Uber and Bitcoin experience that regulatory pressures still matter in a digital age; institutional infrastructure is critical. Anecdotal evidence suggests that regulatory powers will succeed. Unless, however, digital-enabled legitimating strategies, such as Uber using social movement tactics to mobilize their client network to influence government officials, are having an impact in multiple jurisdictions (Dougherty & Isaac, 2015).

- Professions and occupations in a digital world: Scott (2008) has argued that professionals are key institutional agents. Implementing digital innovations have grave impact on the identity, autonomy and boundaries of professions and occupations (Barrett et al., 2012; Berente & Yoo, 2012; Hultin & Mähring, 2014; Lifshitz-Assaf, 2017). Digital transformation not only affects less organized professions, such as academics, but also highly organized professions, such as doctors. How do these dynamics play out in other professions, such as law? How does this profession respond to crowd-based organizations (e.g. UpCounsel) or artificial intelligence applications to reorganize basic legal services (Garon, 2013; Winick, 2017)?
- Digital innovation in organizations: As our prototypical examples of Manulife, NASA and Lego suggest organizations struggle with radical change to adopt novel digital institutional arrangements that are radical and transformational. Blending theoretical perspectives such as institutional complexity (Besharov & Smith, 2014; Greenwood et al., 2011), institutional work (Gawer & Phillips, 2013; Lawrence & Suddaby, 2006), socio-materiality (Glaser, 2017; Leonardi & Barley, 2008; Orlikowski, 2007) and ambidexterity (Tushman & O'Reilly III, 2006) may be useful ways of grasping how organizations cope with these challenges.

In sum, while digital innovation involves novel forms of organizing, institutional infrastructure and institutional building blocks, these interact with their existing counterparts. As the combinations of innovation become digital transformations, then institutional theory can provide us with theoretical and policy purchase.

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